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ABSTRACT

One of a set of six guides for an industrial arts curriculum at the junior high school level, this guide provides the basic foundation to develop a one-semester course based on the following cluster concept: insights into industry and technology. An overview of industry and technology is provided to serve as an integrator or unifier of industry and technology as a whole rather fragmented parts. Emphasis in the guide is on the discipline of industrial technology in relation to the role of industry materials, personnel, production, processes, energy, management, distribution, and occupational information. Following an introduction covering rationale, cluster outlines and objectives, and cluster taxonomic structure, eight units are presented: introduction to industry and technology, elements of producing a product, processes of industry, resources, organization of industry, mass production, marketing, and sociological and environmental impacts of industry and technology. Each unit includes unit objectives, student competencies and related student activities, unit outline, and where applicable, illustrations and information sheets. (SH)

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INDUSTRIAL ARTS

INSIGHTS INTO INDUSTRY and TECHNOLOGY

Curriculum Guide

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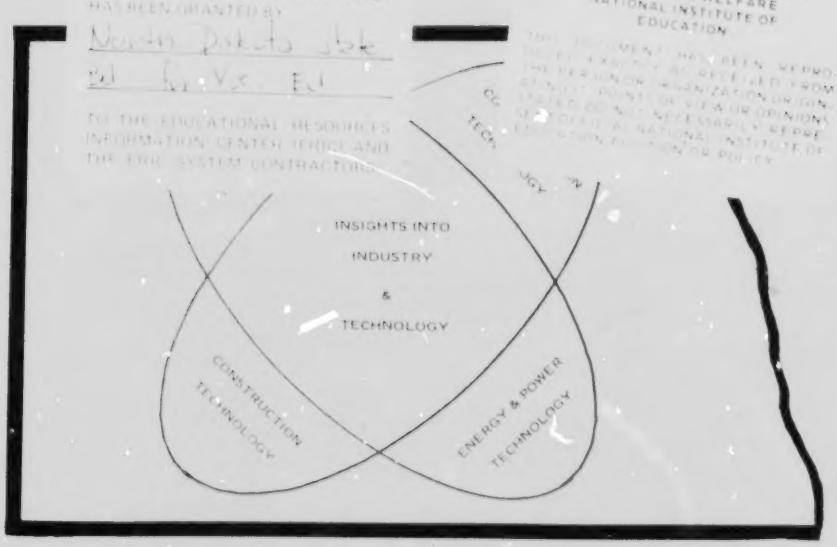

NORTH DAKOTA

NORTH DAKOTA STATE BOARD FOR
VOCATIONAL EDUCATION
Bismarck, North Dakota

CE 014 261

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INSIGHTS INTO INDUSTRY AND TECHNOLOGY

RATIONALE: Human's create social institutions such as industry and the related technologies which effect their culture. This constitutes the source of subject matter for industrial arts in the human, technical, and culture complexes. The study of all complexes is essential to an understanding of industry and technology. Each must be studied within the context of the others.

A historical and social analysis of human endeavors in varicus cultures establishes many of the human universal technological endeavors. Human beings in all stages of their technical developments have been builders, communicators, producers, developers, transporters, craftsmen, and organizers. These technical endeavors have become the basis of curriculum content for industrial arts education.

Since industry and technology have become dominant elements in all societies, the citizenry should know what industry is, understand the impact of technology on society, be aware of industrial and related careers, know how to explore with the tools and materials in a safe and logical manner.

This introductory course "Insights into Industry and Technology" provides the framework for the learner to view the "whole" of industry and technology. This is considered a prerequisite to the study of the parts: 1. Graphic Communication, 2. Manufacturing, 3. Construction, and 4. Energy and Power technical cluster areas.

The course also serves as an integrator or unifier for the whole discipline area of industrial technology. In addition to the universal elements of industry and technology, it provides the learner with a

perspective of the interrelationships of the four technical cluster areas.

In fact, the success of the cluster system depends upon the unified treatment of this course because the four clusters, while eliminating a great deal of fragmentation compared to the traditional system, are themselves fragments of a larger whole.

One should also be aware that even though a unified theme is used throughout the course, some units are out of natural sequence to permit a progression of activities from individual to group which is so necessary at this level.

This course is basic to the general education of all pupils even in the absence of further opportunities in industrial arts.

OBJECTIVES: Primary objectives of Insights into Industry and Technology are to assist the student to:

1. A historical perspective into the development and progress of man through the use of tools culminating in a study of modern industry and technology.
2. Develop a concept of what industry is, and provide insights into the relationships that exist between all the common elements of industry and technology.
3. Provide an insight into the relationships that exist between industry and society, which will enable the student to survive and prosper in the resultant environment.
4. Develop an awareness and initiate an exploration of industrial and related careers.
5. Develop abilities in the safe and proper use of industrial tools and materials.
6. Provide an introduction to the study of the four industrial clusters.

INSIGHTS INTO INDUSTRY AND TECHNOLOGY

GUIDELINES FOR IMPLEMENTATION

As indicated in the rationale statement, this course should provide a balanced concept of the entirety of industry, not in isolation, but in relation to all of society and the physical environment. This perspective is a necessity for successful study of the clusters and is basic to the function of industrial arts in the school system.

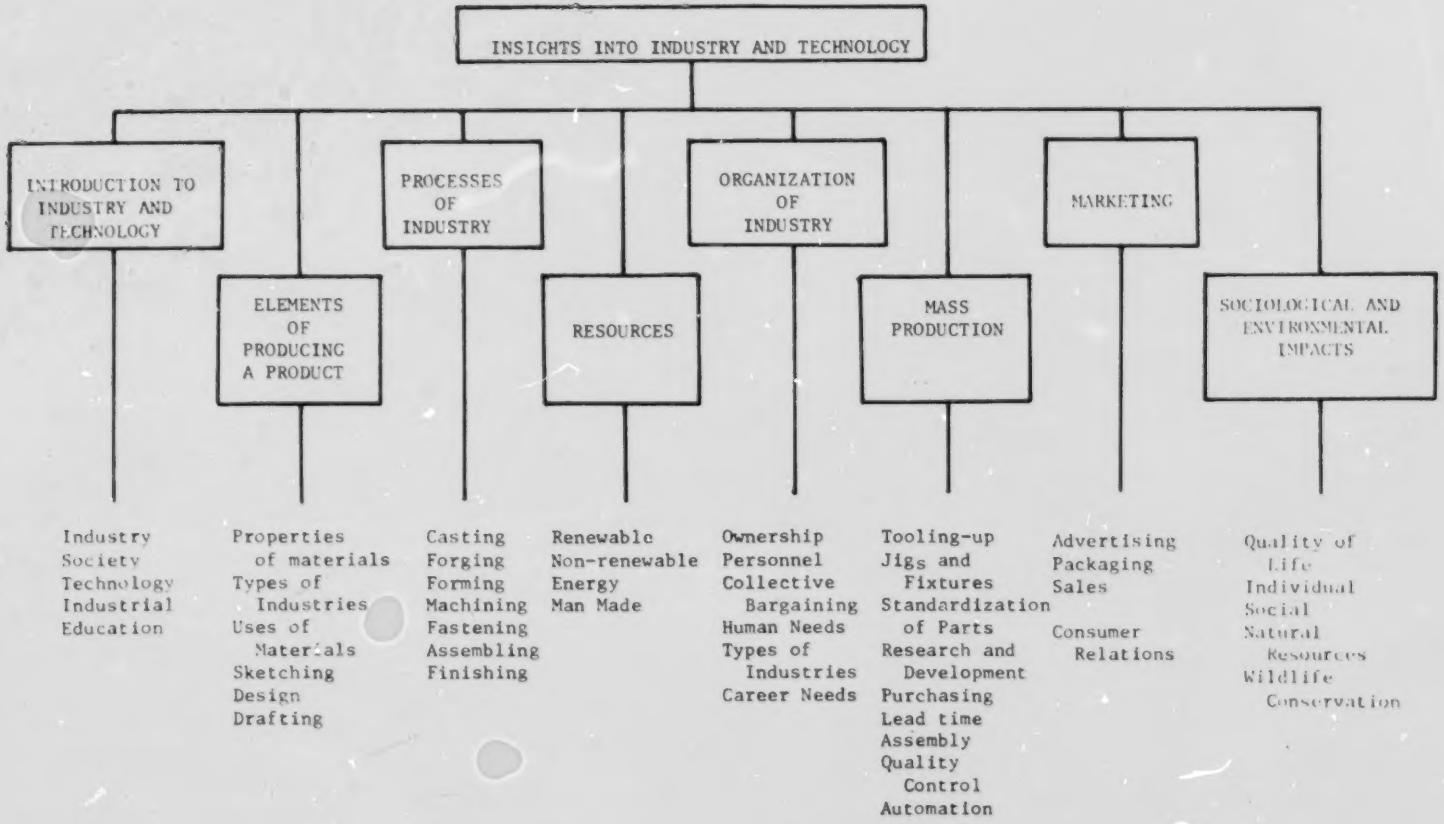
To ensure that this purpose is met, the teacher approaching this course for the first time should attempt consciously to maintain the integrity of units as presented and avoid the temptation to stress a favorite at the expense of the others.

One should also attempt to gather all references listed and continue to search for others aggressively. Much of the material needed for this course is of the free or inexpensive variety. Sources of audio visuals, demonstration and discussion materials are numerous and may be obtained through governmental agencies, national companies and local firms. New learning activities should be constantly sought and added for future use.

In terms of equipment, this cluster should require little that is not already available if one has an existing program or plans to add the four cluster areas.

If no program exists, the state supervisor for industrial arts can provide information on necessary handtools and basic power machines and equipment

TAXONOMETRIC STRUCTURE



INSIGHTS INTO INDUSTRY AND TECHNOLOGY

BODY OF KNOWLEDGE

1.00 INTRODUCTION TO INDUSTRY AND TECHNOLOGY

- 1.10 Defining American Industry
  - 1.11 Definition
  - 1.12 Purpose
  - 1.13 Organization
  - 1.14 Types
- 1.20 History of Industry
  - 1.21 Home system
  - 1.22 Craft guilds
  - 1.23 Factory system
  - 1.24 Industrial Revolution
  - 1.25 Interchangeability of parts
  - 1.26 Mass production
  - 1.27 Automation
- 1.30 Man's Dependence on Industry
  - 1.31 Home
  - 1.32 Job
  - 1.33 School
  - 1.34 Mobility
- 1.40 Industrial Interdependence
  - 1.41 Complexity of products
  - 1.42 Transportation
  - 1.43 Energy
  - 1.44 Subassemblies, subcontracting
- 1.50 Defining Technology
  - 1.51 Definition
  - 1.52 Development of technology
  - 1.53 Technology and industry
  - 1.54 Technology and society
- 1.60 Role of the Industrial Arts Laboratory
  - 1.61 Definition of a laboratory
  - 1.62 Simulation
  - 1.63 Exploration
    - 1.631 Safety
    - 1.632 Orderliness

2.00 ELEMENTS OF PRODUCING A PRODUCT

- 2.10 Properties of Materials
  - 2.11 Hardness
  - 2.12 Brittleness
  - 2.13 Weight
  - 2.14 Flexibility
  - 2.15 Heat conductivity
- 2.20 Uses of Common Industrial Materials
  - 2.21 Woods
  - 2.22 Plastics
  - 2.23 Ferrous metals
  - 2.24 Nonferrous metals
  - 2.25 Paper
  - 2.26 Compositions
  - 2.27 Alloys
  - 2.28 Textiles
  - 2.29 Ceramics
  - 2.210 Glass
  - 2.211 Concrete
  - 2.212 Rubber
- 2.30 The Four Types of Industries
  - 2.31 Manufacturing
  - 2.32 Construction
  - 2.33 Energy and power
  - 2.34 Graphic Communication
- 2.40 Sketching and Design Drafting
  - 2.41 Freehand sketching (orthographic)
  - 2.42 Freehand sketching (isometric)
  - 2.43 Alphabet of lines
  - 2.44 Geometrics
  - 2.45 Drafting Instruments
  - 2.46 Plate layout
  - 2.47 Centering
  - 2.48 Lettering
  - 2.49 Sample orthographic plates
  - 2.410 Dimensioning
  - 2.411 Design a project to be constructed

3.00 PROCESSES

- 3.10 Safety
  - 3.11 Personal safety
  - 3.12 Participants safety
- 3.20 Planning
  - 3.21 Layout
  - 3.22 Estimating
- 3.30 Tool Identification and Use

3.40 Forming
- 3.41 Casting or molding
  - 3.411 One shot molding
  - 3.412 Permanent molds
- 3.42 Compressing or stretching
  - 3.421 Forging
  - 3.422 Bending
  - 3.423 Drawing
- 3.43 Conditioning material
  - 3.431 Heat conditioning
  - 3.432 Physical mechanical deforming
  - 3.433 Chemical reactions
  - 3.434 Physical condition

3.50 Separating
- 3.51 Shearing
- 3.52 Clip removing
- 3.53 Other processes
  - 3.531 Thermal erosion
  - 3.532 Chemical separating
  - 3.533 Electrochemical separating
  - 3.534 Induced fracture

3.60 Combining
- 3.61 Mixing
- 3.62 Coating
  - 3.621 Organic (varnish, lacquer, enamel)
  - 3.623 Vitreous (glass coating)
- 3.63 Bonding
  - 3.631 Fusion bonding (welder)
  - 3.632 Adhesive (glue)
- 3.64 Mechanical fasteners
  - 3.641 Thread and twine
  - 3.642 Wire and rope
  - 3.643 Others

4.00 INDUSTRIAL RESOURCES

4.10 Kinds of raw materials
- 4.11 Mineral fuels
- 4.12 Non-metallic minerals
- 4.13 Metallic minerals

4.20 Extraction
- 4.21 Surface mining
- 4.22 Underground mining
- 4.23 Drilling

4.30 Reproducible Materials
- 4.31 Plant and animal sources

4.40 Non-renewable Materials
- 4.41 All other material sources
- 4.42 Recycling
- 4.43 Conservation of our resources

4.50 Types of Energy
- 4.51 Mechanical
- 4.52 Radiant
- 4.53 Chemical
- 4.54 Heat
- 4.55 Electrical
- 4.56 Nuclear

4.60 Man Made Materials (Synthetics)

4.70 Converting Raw Materials
- 4.71 Preparation for refining
- 4.72 Refining
  - 4.721 Resultant by-products
- 4.73 Controlling quality
- 4.74 Bulking
- 4.75 Converting
  - 4.751 Preparation for converting
  - 4.752 Ways of converting

4.80 Durable and Non-durable (materials)

5.00 ORGANIZATION OF INDUSTRY

5.10 Ownership of Industry
- 5.11 Private
- 5.12 Cooperative
- 5.13 Public

5.20 Personnel of Industry
- 5.21 Managerial
  - 5.211 Planning
  - 5.212 Organizing
  - 5.213 Controlling
- 5.22 Labor (non-managerial)
  - 5.221 Hiring
  - 5.222 Training
  - 5.223 Working
  - 5.224 Advancing
  - 5.225 Retiring

5.20 Collective Bargaining
- 5.31 Laws
- 5.32 Employers
- 5.33 Employees
- 5.34 Grievance procedures
  - 5.341 Negotiation
  - 5.342 Mediation
  - 5.343 Arbitration
  - 5.344 Strike

5.40 Types of Industries
- 5.41 Manufacturing
- 5.42 Construction

5.43 Graphic communication
5.44 Energy and power

5.50 Human Needs
5.51 Physical needs
5.511 Necessities of life
5.5111 Regularity of work
5.52 Security needs
5.521 Organized living (not too much uncertainty)
5.53 Love needs
5.531 Need to be needed
5.532 Need to be appreciated
5.533 Need to belong
5.54 Esteem needs
5.541 Respect
5.5411 Self respect
5.5412 Respect from others
5.55 Self-fulfillment needs
5.551 Desire to become what one can be

5.60 Career Needs
5.61 Educational requirements
5.62 Working conditions
5.63 Location of work
5.64 Regularity of work
5.65 Working hours
5.66 Chances of advancement

6.00 MASS PRODUCTION

6.10 Standardization of Parts

6.20 Terminology of Mass Production

6.30 Elements of Mass Production
6.31 Research and development
6.32 Purchasing
6.33 Lead time
6.34 Tooling up
6.35 Assembly and subassemblies

6.40 Quality Control and Craftsmanship

7.00 MARKETING OF PRODUCTS

7.10 Advertising
7.11 Graphics
7.12 Communications
7.13 Profits

7.20 Packaging
7.21 Package fabrication
7.22 Package graphics

7.23 Transportation
7.231 Truck
7.232 Rail
7.233 Air
7.234 Water
7.24 Displaying

7.30 Sales
7.31 Industry to industry
7.32 Consumer direct
7.33 Wholesalers
7.34 Retailers
7.341 Mail order houses
7.342 Telephone sales
7.343 Discount houses
7.344 Department stores

7.40 Consumer Relations
7.41 Serviceability
7.42 Warrantees
7.43 Guarantees

8.00 SOCIAL AND ENVIRONMENTAL IMPACT

8.10 Quality of Life
8.11 Job life
8.12 Advancements

8.20 Government Regulations
8.21 O[illegible]A. requirements
8.22 Environmental Protection Agency
8.23 Compulsory retirement

8.30 Living Conditions
8.31 Home life
8.32 Crowded Conditions
8.33 Mass Transportation

INSIGHTS INTO INDUSTRY AND TECHNOLOGY

MAJOR UNITS

1.00 INTRODUCTION TO INDUSTRY AND TECHNOLOGY . . . . . 2 Days

2.00 ELEMENTS OF PRODUCING A PRODUCT . . . . . 15 Days

3.00 PROCESSES OF INDUSTRY . . . . . 35 Days

4.00 RESOURCES . . . . . 5 Days

5.00 ORGANIZATION OF INDUSTRY . . . . . 10 Days

6.00 MASS PRODUCTION . . . . . 10 Days

7.00 MARKETING . . . . . 10 Days

8.00 SOCIOLOGICAL AND ENVIRONMENTAL IMPACTS OF INDUSTRY AND TECHNOLOGY . . . . . 3 Days

UNIT I

1.00 INTRODUCTION TO INDUSTRY AND TECHNOLOGY 2 Days

OBJECTIVES: At the end of this unit the student will be able to:

1. Demonstrate an understanding of what industry is and how it meets man's needs.
2. Demonstrate an understanding of what technology is and how it is used in industry.

UNIT OUTLINE

1.10 Defining American Industry
- 1.11 Definition
- 1.12 Purpose
- 1.13 Organization
- 1.14 Types

1.20 History of Industry
- 1.21 Home system
- 1.22 Craft guilds
- 1.23 Factory system
- 1.24 Industrial Revolution
- 1.25 Interchangeability of parts
- 1.26 Mass production
- 1.27 Automation

1.30 Man's Dependence on Industry
- 1.31 Home
- 1.32 Job
- 1.33 School

1.34 Mobility

1.40 Industrial Interdependence

1.41 Complexity of products

1.42 Transportation

1.43 Energy

1.44 Subassemblies, subcontracting

1.50 Defining Technology

1.51 Definition

1.52 Development of technology

1.53 Technology and industry

1.54 Technology and society

1.60 Role of the Industrial Arts Laboratory

1.61 Definition of a laboratory

1.62 Simulation

1.63 Exploration

1.631 Safety

1.632 Orderliness

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition. McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975. Chapter 1.

REFERENCES: Lindbeck, John R., and Irvin L. Lathrop, GENERAL INDUSTRY, Chas. A. Bennett Co., Inc., Peoria, Illinois, 1977. Chapter 1.

Olson, Delmar W., TECNOL-O-GEE, INDUSTRIAL ARTS--INTERPRETER OF TECHNOLOGY FOR THE AMERICAN SCHOOL, Office of Publications, School of Education, North Carolina State University, Raleigh, North Carolina, 1973.

UNIT NO. I	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
1.00	INTRODUCTION TO INDUSTRY AND TECHNOLOGY THE STUDENT WILL BE ABLE TO:	
1.10	A. Orally or in writing define one or more aspects of industry.	A1. Write a report explaining how technology has freed man from drudgery and improved his lifestyle.
1.20	A. Trace orally or in writing the progress of industrial development.	A1. Discuss an analysis of a piece of equipment found in the home in terms of the different technologies and industries needed to produce it. Example: kitchen range, demonstrate bow drill. A2. Initiate a group discussion as to the importance of each major cluster of industries by asking students to imagine life without each one in turn.
1.30	A. Discuss orally or in writing man's dependence on industry using examples he is familiar with.	A1. Students collect newspaper clippings relating to man's dependence on industry, and the affect of industry on man. A2. Discuss local industries. A3. Students collect newspaper ads of locally manufactured products.

UNIT NO. I	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
1.40	A. Discuss industrial interdependence by referring to a single laboratory machine.	A1. List the industries responsible for the manufacturing of one machine including raw materials, energy, and transportation. Example: drill press, jigsaw.
1.50	A. Define one or more of the aspects of technology.	A1. Refer to transparency at end of unit.
1.60	A. Connect verbally or in writing the school laboratory and industry.	A1. A lab is used to simulate industry. Example: 1. lab tour, 2. show previous projects, 3. stress orderliness and safety.

1.4

THE SCHOOL IN A TECHNOLOGICAL CULTURE

In any culture the primary function of the school is to acquaint the young with the nature of their culture. At its most basic level, this is education for survival of the race. In a primitive, as in an advanced society understanding of the technology of that culture is basic to survival. Since the American culture is characteristically and intensely technological, it follows that the primary function of its schools is to acquaint the young with the nature of the technological culture. In so doing it must acquaint them with the technology itself.

The American school as an institution is in principle, if not in practice, committed to assisting the individual in the discovery, development, realization, and release of his own talent potential. In effecting this responsibility the school calls on industrial arts to assist him in the process of self-realization within the context of the technology. This commitment is implemented and realized within a culture that is technological. It is facilitated by the use of the technology of that culture.

It is assumed in this industrial arts that individual man has a native potential for thinking and learning, for reasoning and problem-solving, for imagining and creating, and for constructing and expressing with hands, materials, tools, machines, ideas, and energies. Because he possesses these capabilities, he is able to produce the technology, to use it, and to advance it. Every student is seen as having a measure of such capability but all do not have the same measure.

The fish from birth is at home in its medium. But man is in conflict with the very environment which he creates for himself. He must

be able to understand, to use wisely, to control, and to change what he creates in technology. Industrial arts education offers to assist individuals to cope with the technology in a given environment.

WHAT TECHNOLOGY IS

Technology is the many faceted phenomenon in materials created and advanced by man to free himself from enslavement by nature, but when undisciplined, enslaves its own creator. Following are several identities, or faces, which together describe this phenomenon. Each face as a concept has a role in the curriculum. TECHNOLOGY is the material culture. It is the total of what man knows about and does with materials. It has a history as old as pre-man and a future as great as man's imagination.

TECHNOLOGY is man gaining advantage over nature. It is his means to taming a hostile nature. He provides his own climates, travel, and communications. He creates materials and replaces muscle power with machines--none of which nature did for him.

TECHNOLOGY is man creating his own environment on earth, in air, in space, in and on the sea enabling him to live where he will. Technology is the man-made environment.

TECHNOLOGY is man creating his own culture. Technological developments impact on and affect the social, economic, moral, political, and environmental aspects of living. As technology advances culture changes.

TECHNOLOGY is man expressing himself with materials, tools, machines, energies. Such expression is as natural and pleasurable with him as is expression with words.

TECHNOLOGY is man making himself. Man is by nature a maker and creator. The technology which he creates impacts on him changing his ways of thinking, doing, and living as well as his values, standards, and concerns.

It even changes his physiology. Thus, it is the most powerful force created by man. It changes its own creator.

TECHNOLOGY is man at work producing goods and services, but at the same time, technology is man finding ways to minimize, simplify, and eliminate work. Witness the declining length of the work week for the past century.

TECHNOLOGY is man creating his own leisure. The purpose of work is leisure--the time which man has for doing what he chooses. His personal fulfillment comes increasingly less in his work and increasingly more in his leisure. Technology provides him with things to use in his leisure.

IMPACTS AND CONSEQUENCES OF TECHNOLOGICAL ADVANCE

Technological advance impacts on man, for example, it:

RELEASES him from drudgery;

REPLACES muscle power with machine;

ENABLES him to become increasingly well-informed;

PERMITS him to go where he will on land and sea and in air and space;

PROVIDES him with an abundance of leisure and things with which to use it;

SUPPLIES the means for creating his own environment;

FEEDS, clothes, and equips him with increasingly better products;

HOUSES him in comfort and convenience;

MAKES increasingly better medical care possible;

FREES him for an increasingly higher level of living;

but at the same time, it:

OBSOLETES his houses, cities, streets, highways;

ANTIQUATES his material goods and services;

CONGESTS his available land and air space with vehicles;

POLLUTES his water supply, lakes, rivers, seas, self;

CONTAMINATES the air he must breathe, destroying life-supporting oxygen;

INVADES his privacy with noise, congestion, odors;

CONSUMES his natural environment and destroys the beauty of what remains;

OBSOLETES his jobs, changing the nature of work and of skills;

CHANGES his customs, manners, mores, values, institutions, and self;

GIVES him more leisure than he can wisely use, a forced leisure.

Technological advance changes things; it changes culture; and it changes man himself. A capability of such magnitude is grounds for its study in American schools.

TECHNOLOGY AND ENVIRONMENT

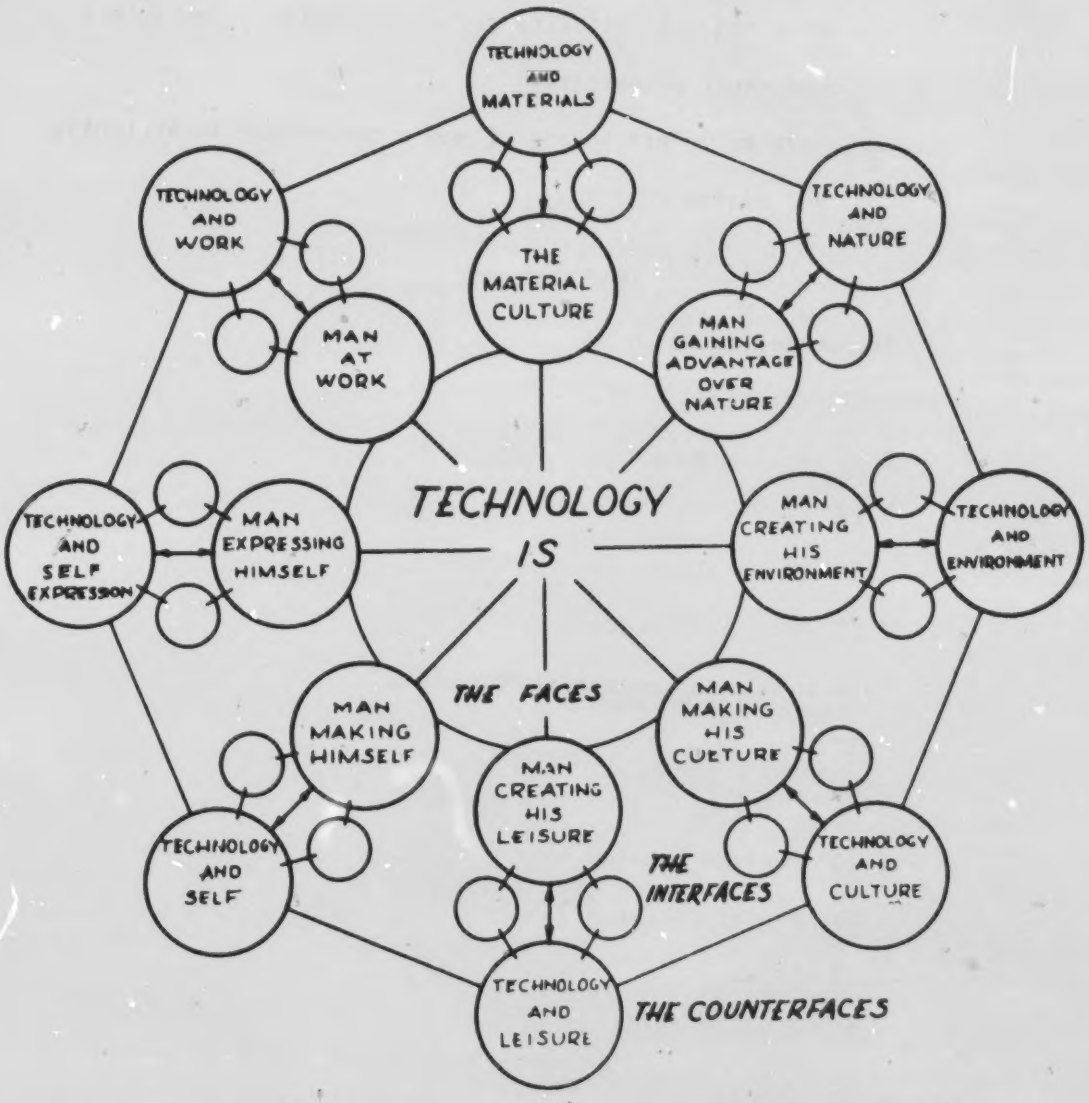
Technology is man creating his own environment on earth, in air, and space, and in and under the sea. Technology is man changing the natural environment. In the process man uses his technology to gain advantage over nature. Technology is man-made and is the environment he makes for himself. Millions of people, for example, are born, live, work, and die in cities which are designed, constructed, and destructed by people and for people. The technological environment is new and changing while becoming obsolete and undesirable at the same time.

Nature is the natural environment of the planet. To continue to exist the planet must be in balance with itself. While at times and places it is hostile to man, it is the sine-qua-non of his existence. Technology consumes the natural environment, the planet, as it mines, smelts, and manufactures with materials. Technology changes the natural environment as it consumes, displaces, and moves it. Technological wastes pollute and have the capability of destroying the natural environment.

The study of technology without concern for its impacts and consequences on the environment is but a study of bolts and nuts. As such it is dangerous. It suggests that man does not see his technology for what it really is, the most powerful force for change he has to contend with. It suggests, too, that he may destroy himself and his planet in his ignorance. Industrial arts as interpreter of technology examines the dimensions and potential of technology as that force. It helps the student to understand the relationship of technology to man and his environment. Can technology, man, and environment live in harmony? This is man's greatest challenge in the last half of the twentieth century. It is upon him now.

TECHNOLOGY

ITS FACES, COUNTERFACES, AND INTERFACES



Delmar W. Olson

1.10

UNIT II

2.00 ELEMENTS OF PRODUCING A PRODUCT 15 Days

OBJECTIVES: At the end of this unit, the student will be able to:

1. Have and understanding and appreciation of materials and their properties.
2. Have an understanding of and a competency in sketching and design drafting.

UNIT OUTLINE

2.10 Properties of Materials

- 2.11 Hardness
- 2.12 Brittleness
- 2.13 Weight
- 2.14 Flexibility
- 2.15 Heat conductivity

2.20 Uses of Common Industrial Materials

- 2.21 Woods
- 2.22 Plastic
- 2.23 Ferrous metals
- 2.24 Nonferrous metals
- 2.25 Paper
- 2.26 Compositions
- 2.27 Alloys
- 2.28 Textiles
- 2.29 Ceramics
- 2.210 Glass

2.211 Concrete

2.212 Rubber

2.30 The Four Types of Industries

2.31 Manufacturing

2.32 Construction

2.33 Energy and power

2.34 Graphic Communication

2.40 Sketching and Design Drafting

2.41 Freehand sketching (orthographic)

2.42 Freehand sketching (isometric)

2.43 Alphabet of lines

2.44 Geometrics

2.45 Drafting instruments

2.46 Plate layout

2.47 Centering

2.48 Lettering

2.49 Sample orthographic plates

2.410 Dimensioning

2.411 Design a project to be constructed

TEXT: WORLD OF MANUFACTURING, IACP, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1971. Readings 44, 45, 46, & 47.

REFERENCES: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975.

SELECTED TRANSPARENCY MASTER, Curriculum and Instructional Materials Center, State Department of Vocational and Technical Education, Stillwater, Oklahoma.

UNIT NO. II	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
2.00	ELEMENTS OF PRODUCING A PRODUCT THE STUDENT WILL BE ABLE TO:	
2.10	A. Observe properties of various materials.	A1. Examine sample of materials by handling. Example: 1. Metal sample 2. Plastic 3. Wood 4. Paper 5. Composition
2.20	A. Select a suitable material when given a project to design.	A1. See sample activity appendix.
2.30	A. Verbally identify the types of goods and services produced in each of the four industrial clusters.	A1. Explanation of four clusters by observing transparency. Example: Products of four clusters.
2.40	A. Demonstrate competency in freehand orthographic and isometric sketching.	A1. Freehand orthographic sketching and freehand isometric sketching.
	B. Demonstrate competency in freehand lettering.	B1. Complete jobsheet on lettering and complete alphabet of lines. (See transparancy).
	C. Demonstrate competency in the use of drafting instruments.	C1. Complete several plates using instruments.
	D. Demonstrate design capability.	D1. Design and draw a project.

2.3

MATERIAL SELECTION

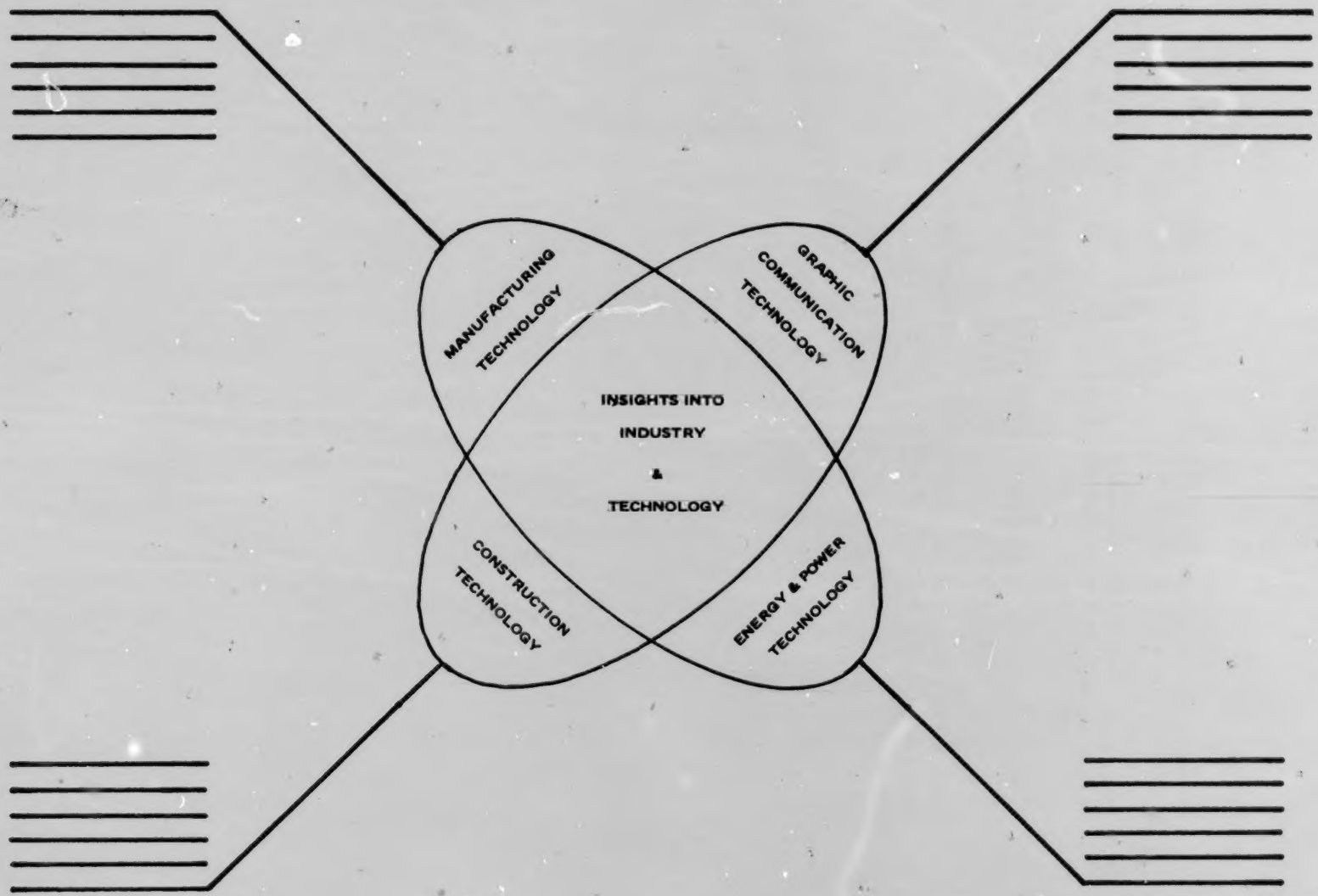
PROCEDURE:

A. Instructor asks students to list all materials they can think of and list them on the chalkboard.

B. Instructor then gives students a project idea and asks them to select materials out of the above list that could be utilized to construct the object.

   1. Give enough suggestions to utilize all or most of the material.

C. Instructor should bring physical properties of materials into discussion using samples of each material.


MANUFACTURING TECHNOLOGY
GRAPHIC COMMUNICATION TECHNOLOGY
INSIGHTS INTO INDUSTRY & TECHNOLOGY
CONSTRUCTION TECHNOLOGY
ENERGY & POWER TECHNOLOGY

2.5

BASIC MEASUREMENT

TERMINAL OBJECTIVE

After completion of Unit I, the student should be able to identify tools used in measuring. He should be able to distinguish between 1/8 inch and 1/16 inch scale rulers and demonstrate the ability to read rules and tapes to the 16ths scale. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the post test.

SPECIFIC OBJECTIVES

After completion of three hours of instruction, the student should be able to:

1. Identify five tools used in basic measuring.
2. Distinguish between a 1/8 inch graduation ruler and a 1/16 inch graduation ruler.
3. Demonstrate the ability to perform the following skills:
   a. Read a ruler when given a drawing of the ruler and the different locations on the ruler.
   b. Read a ruler and measure objects to the proper dimensions.
   c. Draw lines and objects to the proper dimensions.

BASIC MEASUREMENT

INFORMATION SHEET

I. Types of measuring tools (Transparency 1)

A. Ruler

B. Steel tape

C. Yard stick

D. Zig-zag rule

E. Framing square

F. Combination square

II. Reading a rule

A. Rules read similarly

(NOTE: Except that some are graduated with more divisions per inch than others.)

B. Procedures for reading

1. Determine size of division

a. Locate small figure near division lines

b. Count divisions in one inch

c. Compare with another rule on which divisions are given

d. Judgment acquired after considerable practice

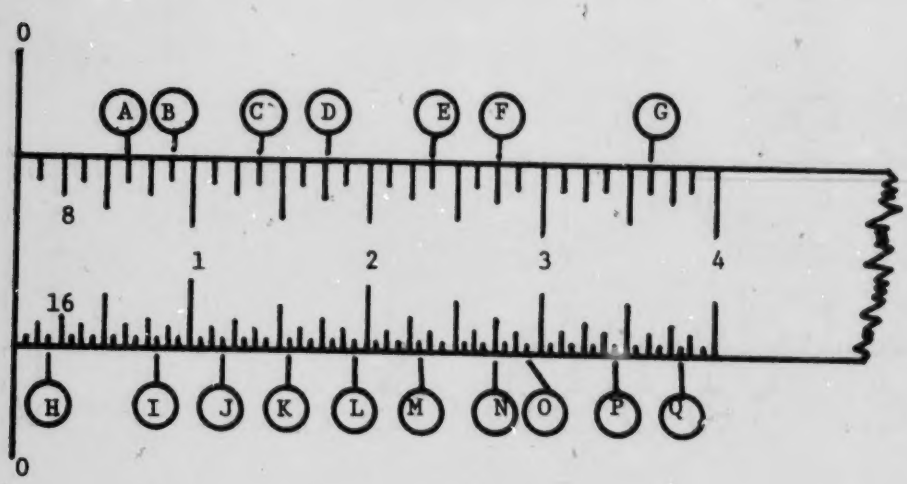
2. Count divisions of size indicated from zero to the last whole inch and add to the whole inch

3. Reduce the answer if possible

4. **Examples--Using the drawing find the distance from 0 to A.**

   a. First--The small 8 indicates that the divisions are 1/8 inch.

   b. Second--From 0 at the end to A, there are five spaces; therefore, 5/8 inch is the measurement.



5. Using the drawing find the distance from H to K.

   a. First--The small 16 indicates that the divisions are 1/16 inch.

   b. Second--By counting the divisions, there are 22 spaces from H to K which equal 22/16 inches.

   Solut 1. 22/16 = 1 6/16 inches = 1 3/8 inches/

   Solut 2. H is at 3/16 inch, K is at 1 9/16 inches.

   1 9/16 inches - 3/16 inch = 1 6/16 inches.
   = 1 3/8 inches.

   Solut 3. From H to 1 inch is 13/16 inch, from 1 inch to K is 9/16 inch.

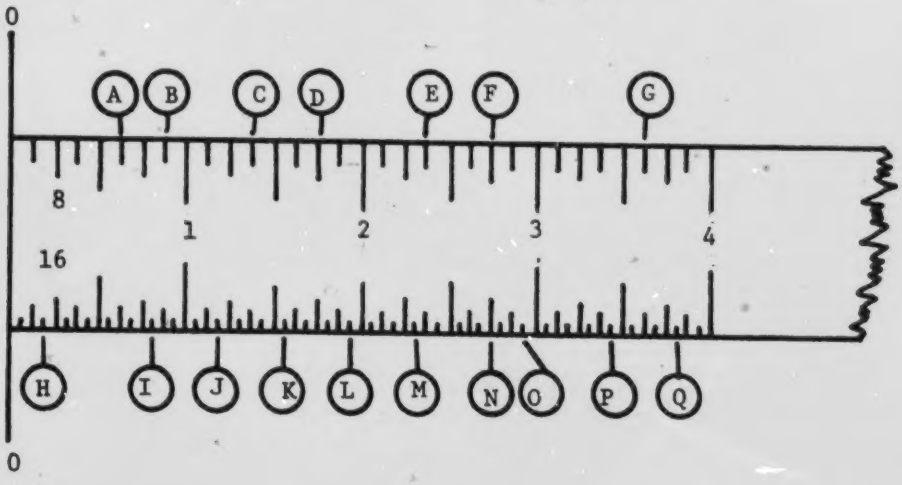
   13/16 inch + 9/16 inch = 1 6/16 inches = 1 3/8 inches.

BASIC MEASUREMENT

UNIT - I

ASSIGNMENT SHEET # 1--READING A RULER

Use the drawing below and work the following exercises.



Find the distance between the following letters.

A. 0 to B _____

B. 0 to E _____

C. B to G _____

D. D to F _____

E. 0 to L _____

F. H to J _____

G. K to Q _____

H. M to Q _____

I. K to L _____

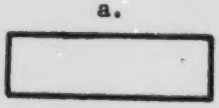
J. I to Q _____

BASIC MEASUREMENT

UNIT I

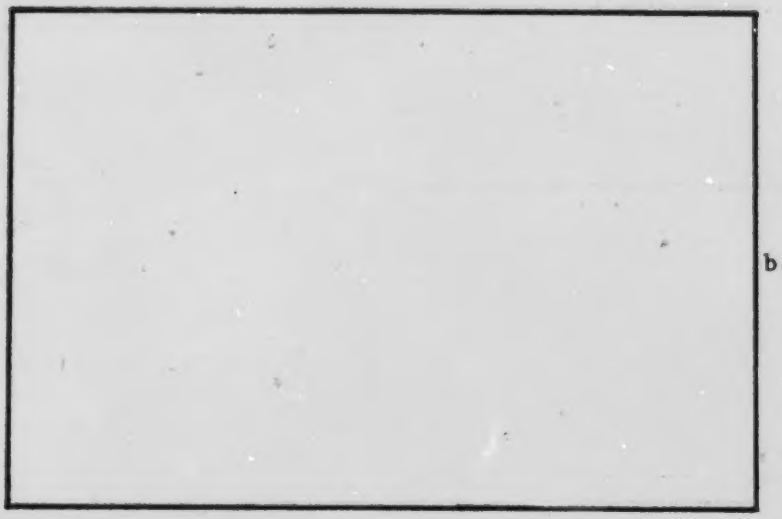
ASSIGNMENT SHEET #2--READING THE RULER AND MEASURING OBJECTS

Using a 1/16 inch scale ruler, measure the following objects.

1. 

a. Length _____

b. Width _____

2. 

a. _____

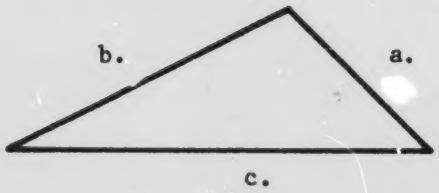
b. _____

3.

a. _____

b. _____

4.

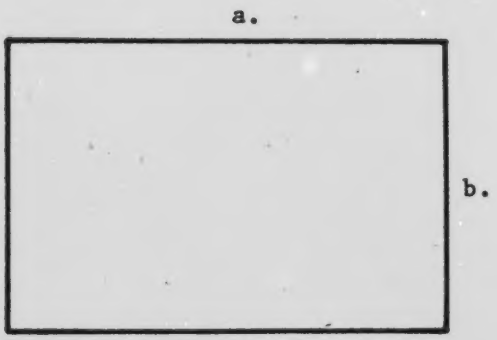


a. _____

b. _____

c. _____

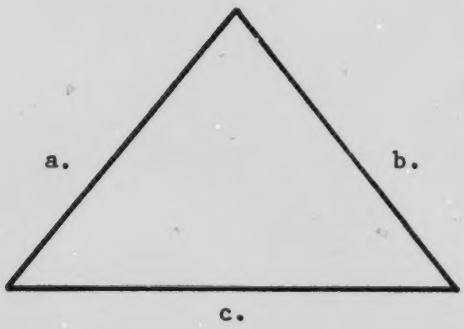
5.



a. Length _____

b. Width _____

6.



a. _____

b. _____

c. _____

BASIC MEASUREMENT

UNIT I

ASSIGNMENT SHEET 83--DRAWING LINES AND OBJECTS ACCORDING TO DIMENSIONS

1. Draw straight lines using the following dimensions.

   a. 3 3/4 inches

   b. 2 1/16 inches

   c. 2 10/16 inches

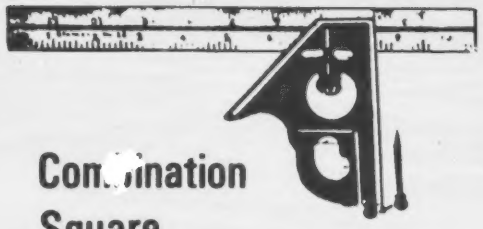
   d. 1 14/16 inches

   e. 2 1/4 inches

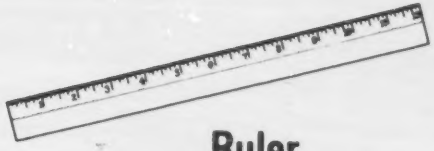
2. Draw a square 1 7/8 inches.

3. Draw a triangle using the following dimensions: 1 1/2 inches by 1 inch by 2 3/4 inches.

Types of Measuring Tools



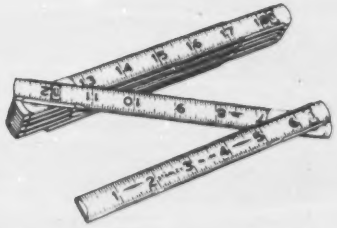
Combination Square



Ruler

Steel Tape

Steel Framing Square

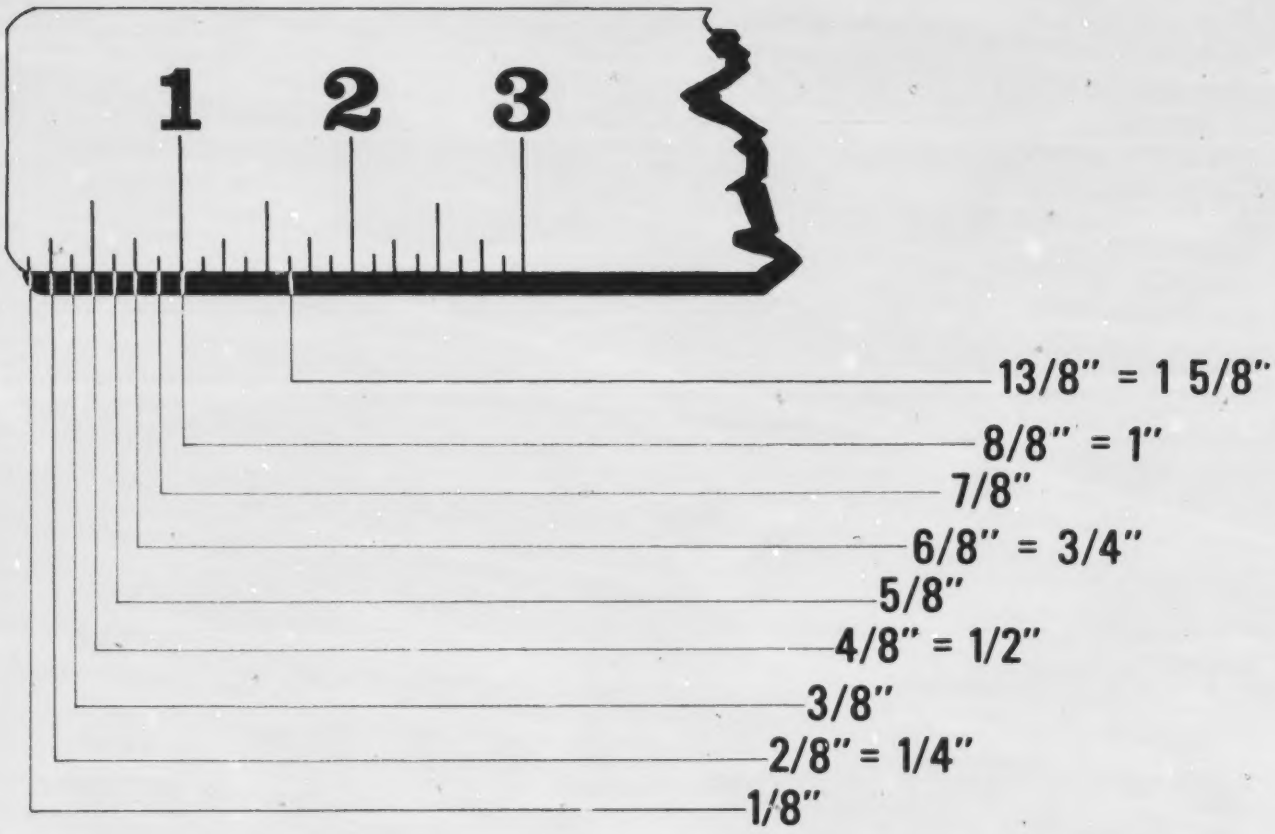


Zig-Zag Ruler

Yard Stick

2.13

Reading the Eighths Rule



2.14

Reading the Sixteenths Rule

37/16" = 2 5/16"
22/16" = 1 6/16"
16/16" = 1"
15/16"
14/16" = 7/8"
13/16"
12/16" = 3/4"
11/16"
10/16" = 5/8"
9/16"
8/16" = 1/2"
7/16"
6/16" = 3/8"
5/16"
4/16" = 1/4"
3/16"
2/16" = 1/8"
1/16"

UNIT III

3.00 PROCESSES 35 Days

OBJECTIVES: At the end of this unit, the student will be:

1. Familiar with processes used in today's industry.
2. Able to demonstrate safety and planning throughout laboratory activities.

UNIT OUTLINE

3.10 Safety

- 3.11 Personal safety
- 3.12 Participants safety

3.20 Planning

- 3.21 Layout
- 3.22 Estimating

3.30 Tool Identification and use

3.40 Forming

- 3.41 Casting or molding
  - 3.411 One shot molding
  - 3.412 Permanent molds
- 3.42 Compressing or stretching
  - 3.421 Forging
  - 3.422 Bending
  - 3.423 Drawing
- 3.43 Conditioning material
  - 3.431 Heat conditioning
  - 3.432 Physical and mechanical deforming
  - 3.433 Chemical reactions

3.434 Physical condition

3.50 Separating

3.51 Shearing

3.52 Clip removing

3.53 Other processes

3.531 Thermal erosion

3.532 Chemical separating

3.533 Electrochemical separating

3.534 Induced fracture

3.60 Combining

3.61 Mixing

3.62 Coating

3.621 Organic (varnish, lacquer, enamel)

3.622 Galvanized or electroplating (metal on metal)

3.63 Bonding

3.631 Fusion bonding (welder)

3.632 Adhesive (glue)

3 64 Mechanical fasteners

3.641 Thread and twine

3.642 Wire and rope

3.643 Others

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975. Chapters 4, & 6--13.

REFERENCES: Lindbeck, John R., and Irvin L. Lathrop, GENERAL INDUSTRY, Chas. A. Bennett Co., Inc., Peoria, Illinois, 1969. Units 5, 33, 41, 45, & 50--55.

THE WORLD OF MANUFACTURING, IACP, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1970. Readings 50--63.

FREE TRANSPARENCY ORIGINALS, Center for Metrics, Western Michigan University.

GENERAL CONSTRUCTION STUDENT MANUAL, Curriculum and Instructional Materials Center, State Department of Vocational and Technical Education, Stillwater, Oklahoma.

UNIT NO. III	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
3.00	PROCESSES THE STUDENT WILL BE ABLE TO:	
3.10	A. Demonstrate safety and proper work habits with tools and machines for personal and fellow students safety while in the lab.	A1. Observe demonstration. A2. Operate under supervision. A3. Pass safety test.
3.20	A. Demonstrate ability to plan, estimate, and layout material for lab activities.	A1. Prepare plans and procedure sheets, estimate materials on estimate sheets, and layout stock wisely and conservatively by using standard material units.
3.30	A. Identify tool and describe its proper use.	A1. Observe demonstration on tool use and identification. (Transparencies). A2. Objective test.
3.40	A. Demonstrate the casting process by preparing a casting. B. Demonstrate compression and sketching process.	A1. Cast plastic, plaster, and lead. Example: 1. Screwdriver handle-scriber handle-letter opener handle 2. Paper weight 3. Fishing bait B1. Construct a napkin holder by bending scrolls. B2. Laminating. B3. Candy dish.

UNIT NO. III	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
	C. Demonstrate metal conditioning by heat treating screw driver blade.	C1. Heat treat screwdriver blade.
3.50	A. Demonstrate various methods of separating materials, shearing, clipping, and other processes.	A1. Observe cutting torch in use. A2. Saw a cut stock using various methods. A3. Shearing with tinner snips. A4. Cut paper with scissors. A5. Grinding stock to demonstrate clipping. A6. Sand or smooth stock. A7. Carving. A8. Drill hole. A9. Bore hole. A10. Shape stock with file. A11. Plane to smooth stock.

3.5

HAND TOOLS

TERMINAL OBJECTIVE

After completion of Unit II, the student should be able to list precautions in the care of tools and demonstrate the ability to use tools safely. He should be able to identify various types of shop tools. This knowledge will be evidenced through demonstration by scoring eighty-five percent on the post test.

SPECIFIC OBJECTIVES

After four hours of instruction, the student should be able to:

1. Name six precautions to follow in care of shop tools.
2. Identify the three types of planes and tell where each is used.
3. Identify the four types of squares.
4. Identify five types of saws and tell where each is used.
5. Identify five types of hammers.
6. Identify three types of screwdrivers.
7. Identify six types of pliers.
8. Identify four types of clamps.
9. Identify four types of levels.
10. Identify three types of vises.
11. Identify four types of wrenches.
12. Identify three types of drills.
13. Identify four types of files.
14. Demonstrate the ability to use each tool safely and according to the recommended use.

HAND TOOLS

INFORMATION SHEET

I. Care of shop tools

A. Do not drop tools

B. Keep tools clean

C. Keep tools sharp

D. Return tools to cabinet after use

E. Keep tools dry and oiled

F. Use tools only for what they were made

II. Types of planes (Transparency 1)

A. Jack--Used for smoothing long surfaces

B. Smoothing--Used for finishing work

C. Block--Used for smoothing ends of boards

III. Types of squares (Transparency 1)

A. Steel framing--Used for squaring boards and timbers and for laying out rafters

B. Try--Used for squaring small pieces of wood

C. T-bevel--Used for marking various angles from 0 to 180 degrees

D. Combination--Used for a variety of jobs as name indicates

IV. Types of handsaws (Transparency 2)

A. Cross-cut--Used for cutting across the grain in wood

B. Rip--Used for sawing with the grain

C. Compass--Used for cutting curves and circles

D. Coping--Used for cutting curves

E. Hack--Used for cutting metal

F. Keyhole--Used for close, inside work

INFORMATION SHEET

V. Types of hammers (Transparency 3)

A. Claw

1. Curved

2. Straight

B. Ballpeen

C. Sledge

D. Half hatchet

E. Engineer's

F. Soft-face

G. Blacksmith's

H. Tack

VI. Types of screwdrivers (Transparency 4)

A. Standard

B. Phillips

C. Off-set

VII. Types of pliers (Transparency 4)

A. Channel lock

B. Needle nose

C. Combination slip joint

D. Vise grip

E. Diagonal

VIII. Types of clamps (Transparency 5)

A. Hand screw

B. Bar

C. "C"

INFORMATION SHEET

IX. Types of levels (Transparency 5)

A. Carpenter's

B. Torpedo

C. Line and surface

X. Types of vises (Transparency 6)

A. Utility

B. Machinist's

C. Blacksmith's

XI. Types of wrenches (Transparency 6)

A. Open-end

B. Adjustable

C. Box-end

D. Combination

XII Types of drills (Transparency 7)

A. Brace

B. Breast

C. Hand

XIII. Types of files (Transparency 7)

A. Flat

B. Rasp

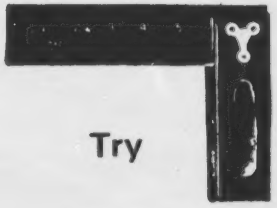
C. Round bastard

D. Taper triangular

Types of Squares and Planes

Steel Framing

Combination



Try

T Bevel

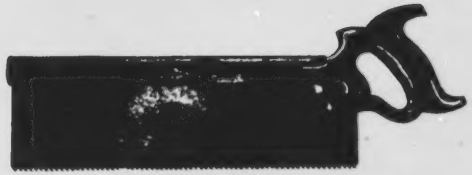
Smoothing Plane

Jack Plane

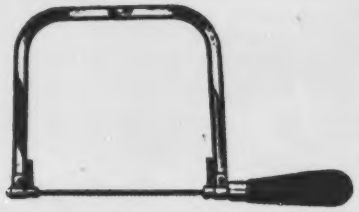
Block Plane

3.10

Types of Handsaws



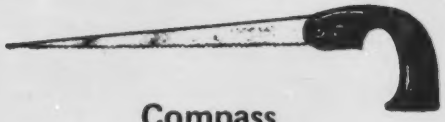
Back



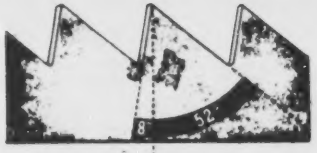
Coping

Hack

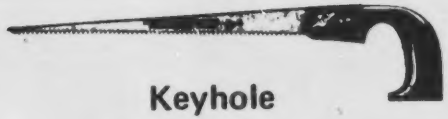
Crosscut



Compass



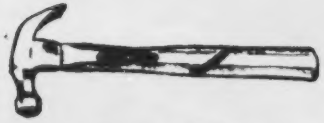
Rip



Keyhole

3.11

Types of Hammers

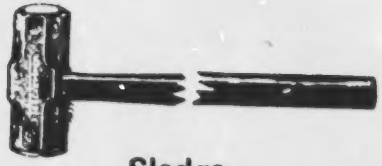


Curved Claw

Straight Claw

Tack

Blacksmiths



Sledge

Ball Pein

Half Hatchet

Engineers

3.12

Types of Pliers and Screwdrivers

Phillips

Offset

Standard

3.13

Linemen's
Side Cutting

Vise-Grip

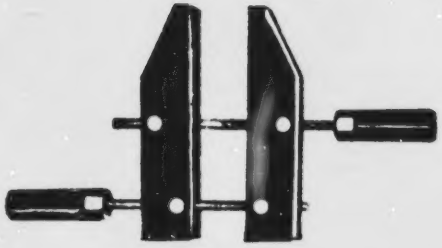
Combination
Slip-Joint

Diagonal

Channellock

Needle Nose

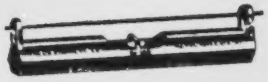
Types of Clamps and Levels



Hand Screw

"C"

Bar



Line

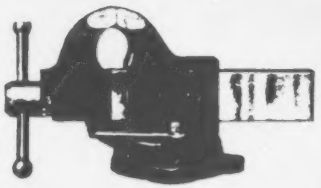
Carpenters

Torpedo

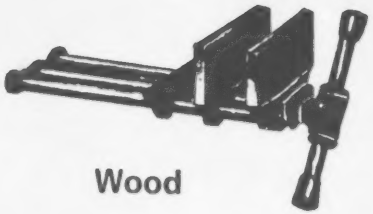
3.14

Types of Vises and Wrenches

Adjustable

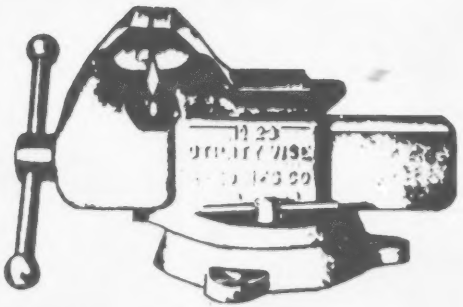


Machinests

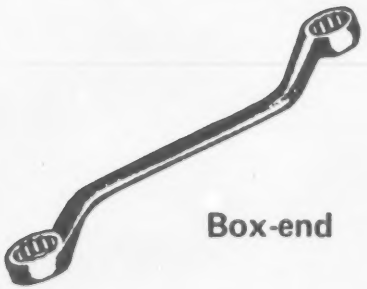


Wood

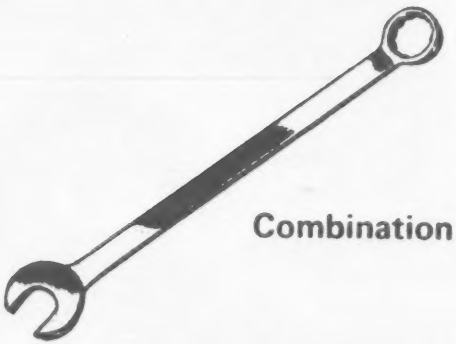
Open-end



Utility



Box-end



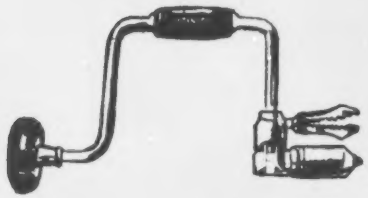
Combination

3.15

Types of Files and Drills

Hand Drill

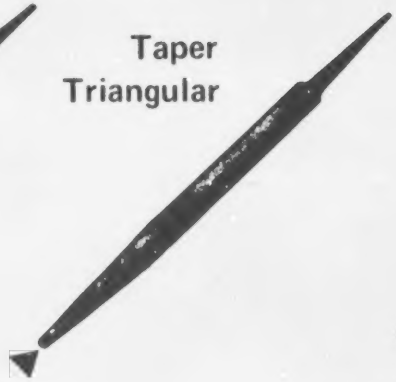
Carpenter Brace



Breast Drill

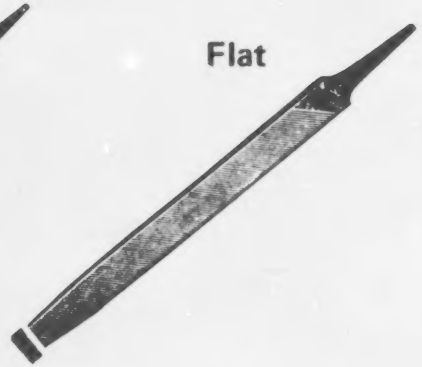
Rasp

Taper
Triangular



Half-Round

Flat



3.16

UNIT IV

4.00 INDUSTRIAL RESOURCES 5 Days

OBJECTIVES: At the end of this unit, the student will:

1. Develop an appreciation for and an understanding of raw materials used in today's industry.
2. Become aware of the processes envolved in converting raw materials to refined materials used in industry.

UNIT OUTLINE

4.10 Kinds of raw materials

- 4.11 Mineral fuels
- 4.12 Non-metallic minerals
- 4.13 Metallic minerals

4.20 Extraction

- 4.21 Surface mining
- 4.22 Underground mining
- 4.23 Drilling

4.30 Renewable Materials

- 4.31 Plant and animal sources

4.40 Non-renewable Materials

- 4.41 All other material sources
- 4.42 Recycling
- 4.43 Conservation of our resources

4.50 Types of Energy

- 4.51 Mechanical
- 4.52 Radiant
- 4.53 Chemical

4.54 Heat

4.55 Electrical

4.56 Nuclear

4.60 Man Made Materials (Synthetics)

4.70 Converting Raw Materials

4.7 Preparation for refining

4.72 Refining

4.721 Resultant by-products

4.73 Controlling quality

4.74 Bulking

4.75 Converting

4.751 Preparation for converting

4.752 Ways of converting

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975.

REFERENCES: THE WORLD OF MANUFACTURING, IACP, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1970. Reading 38--42.

Linbeck, John R., and Irvin L. Lathrop, GENERAL INDUSTRY. Chas. A. Bennett Co., Inc., Peoria, Illinois, 1969. Units 29, 59, 99, 104, 107, & 110.

UNIT NO. IV	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
4.00	INDUSTRIAL RESOURCES THE STUDENT WILL BE ABLE TO:	
4.10	A. Describe the sources of raw materials.	A1. Discuss various natural resources such as sea water, air, and earth. Example: 1. Iron ore 2. Wood 3. Crude oil 4. Limestone 5. Sand-gravel
4.20	A. Describe the processes of raw material extraction.	A1. Observe film on material extraction.
4.30	A. Identify renewable materials and their resources.	A1. Observe examples of renewable and non-renewable materials.
4.40	A. Identify non-renewable materials and their resources.	A1. Write a report on conservation of resources.
4.50	A. Identify energy types and sources.	A1. Examples: Dry cell Thermo coupler Electric generator Solar cell Heat Engines
4.60	A. Identify various man made materials.	A1. List man made materials Example: nylon plastics particle board alloys

UNIT NO. IV	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
4.70	A. Describe methods of raw material conversion.	A1. Film on material conversion, describe refining and complete worksheet on material conversion. Example: 1. Heat engines 2. Electric motors 3. Windmill-sail boats 4. Dry cell 5. Solar cell 6. Piezo Electric effect 7. Nuclear engines

4.4

UNIT V

5.00 ORGANIZATION OF INDUSTRY 10 Days

OBJECTIVES: At the end of this unit, the student will be able to:

1. Develop an understanding of the structure of industry in regard to ownership, management and personnel.
2. Identify the four major types of industries and will have basic understanding of the careers involved within the industries.

UNIT OUTLINE

5.10 Ownership of Industry

- 5.11 Private
- 5.12 Cooperative
- 5.13 Public

5.20 Personnel of Industry

- 5.21 Managerial
  - 5.211 Planning
  - 5.212 Organizing
  - 5.213 Controlling
- 5.22 Labor (non-managerial)
  - 5.221 Hiring
  - 5.222 Training
  - 5.223 Working
  - 5.224 Advancing
  - 5.225 Retiring

5.30 Collective Bargaining

5.31 Laws

5.32 Employer

5.33 Employee

5.34 Grievance procedures

5.341 Negotiation

5.342 Mediation

5.343 Arbitration

5.344 Strike

5.40 Types of Industries

5.41 Manufacturing

5.42 Construction

5.43 Graphic communication

5.44 Energy and power

5.50 Human Needs

5.51 Physical needs

5.511 Necessities of life

5.5111 Regularity of work

5.52 Security needs

5.521 Organized living (not too much uncertainty)

5.53 Love needs

5.531 Need to be needed

5.532 Need to be appreciated

5.533 Need to belong

5.54 Esteem needs

5.541 Respect

5.5411 Self respect

5.4121 Respect from others

5.55 Self-fulfillment needs

5.551 Desire to become what one can be

5.60 Career needs

5.61 Educational requirements

5.62 Working conditions

5.63 Location of work

5.64 Regularity of work

5.65 Working hours

5.66 Chances of advancement

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975. Chapter 1.

UNIT NO. V	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
5.00	ORGANIZATION OF INDUSTRY THE STUDENT WILL BE ABLE TO:	
5.10	A. Define private, cooperative and governmental ownership in regards to the capital and managerial control of an industry.	A1. Class discussion, transparencies, film strips.
5.20	A. Identify the various personnel of industry, their responsibilities and roles through the activities of the Big Builders Game. (IACP)	A1. Play Big Builders Game. (IACP)
5.30	A. Discuss and explain the various capacities of personnel as to labor relations within an industry through role playing these capacities.	A1. Role playing of organized labor.
5.40	A. Discuss with the wage earner in his home the type of work done by that person and then be able to relate that job with the four cluster areas.	A1. Talk with wage earner of the home and decide which cluster area that job fits.
5.50	A. Ask questions of resource people from industries.	A1. Listen to and ask questions of resource people that come to talk to the class. A2. Shadow an employee of an industry. A3. List five industries from each of the four cluster areas.

UNIT VI

6.00 MASS PRODUCTION 10 Days

OBJECTIVES: At the end of this unit the student will be able to:

1. Develop an understanding of the elements that are included in the structure of mass production
2. Have a basic understanding of the production of products from the evolution of ideas to the tooling up and assembly of finished products.

UNIT OUTLINE

6.10 Standardization of Parts

6.20 Terminology of Mass Production

6.30 Elements of Mass Production

- 6.31 Research and development
- 6.32 Purchasing
- 6.33 Lead time
- 6.34 Tooling up
- 6.35 Assembly and subassemblies

6.40 Quality Control and Craftsmanship

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975. Chapter 14.

REFERENCES: THE WORLD OF MANUFACTURING, IACP, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1971. Readings 9, 25, 63, 75, & 76.

SELECTED TRANSPARENCY MASTER, D. C. A. Education Products, Inc., Philadelphia, PA, 1972. Chapter 3.

UNIT NO. VI	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
6.00	MASS PRODUCTION THE STUDENT WILL BE ABLE TO:	
6.10	A. Make a comparison of mass produced parts versus hand made parts.	A1. Observe transparency of interchangability and automation.
6.20	A. Demonstrate his understanding of the basic terms used in mass production by successfully answering objective questions of those terms.	A1. Test on terms of mass production. A2. Construct simple jigs and fixtures. A3. Make flow charts and time studies.
6.30	A. Demonstrate his ability in mass production by successfully completing his assigned task on a mass production project.	A1. Work on mass production project of approximately five days duration. Examples: 1. Survival heater 2. Trivet stand 3. Circuit tester 4. Rocket launcher 5. Greeting cards 6. Foot scraper
6.40	A. Making a report on his accomplishments and understanding of mass production.	

UNIT VII

7.00 MARKETING OF PRODUCTS 10 Days

OBJECTIVES: At the end of this unit, the student will be able to:

1. Have a basic understanding of the packaging, transportating, distribution and sales for a finished product.
2. Have a basic knowledge of the importance of consumer relations by being able to identify methods of product back-up for the finished goods and services.

UNIT OUTLINE

7.10 Advertising

- 7.11 Graphics
- 7.12 Communications
- 7.13 Profits

7.20 Packaging

- 7.21 Package fabrication
- 7.22 Package graphics
- 7.23 Transportation
  - 7.231 Truck
  - 7.232 Rail
  - 7.233 Air
  - 7.234 Water
- 7.24 Displaying

7.30 Sales

- 7.31 Industry to industry

7.32 Consumer direct

7.33 Wholesalers

7.34 Retailers

7.341 Mail order houses

7.342 Telephone sales

7.343 Discount houses

7.344 Department stores

7.40 Consumer Relations

7.41 Serviceability

7.42 Warrantees

7.43 Guarantees

TEXT: Miller, Wilbur R., Marion E. Maddox, and Lavon B. Smith, EXPLORING CAREERS IN INDUSTRY, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1975. Chapters 6 & 14.

UNIT NO. VII	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
7.00	MARKETING OF PRODUCTS THE STUDENT WILL BE ABLE TO:	
7.10--7.4	A. Take part in the preparation of silk screen materials for the identifying and packaging of the mass produced products.	A1. Make silk screen prints for product identification.
	B. Assist fellow students in the making of advertising fliers by the spirit process methods of duplication.	B1. Duplicate fliers to advertise products.
	C. Along with other members of the class take part in the preparation of direct image offset plates to be used in the advertising and instructions of the mass produced product.	C1. Prepare materials for offset press copies of advertising and instruction sheets.
	D. Prepare script and assist in arranging for the verbal advertising of mass produced products by radio communication.	D1. Prepare script and arrange to read over school intercom system.
	E. Gain an understanding of the financial advantages to proper advertising by making a report of various methods used in the advertising industry.	E1. Write a report on the relationship of profit to proper advertising.
	F. Take part in the fabrication of packaging materials by constructing boxes as product containers.	F1. Make paper board boxes of proper size and weight.

UNIT NO. VII	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
	G. Assist fellow students in the packaging of materials by vaccum forming plastic containers for the finished products.	G1. Make vacuum formed containers and bubble packets as containers.
	H. Participate in the packaging of small parts, of the mass produced product, by sealing in poly.	H1. Seal small parts in poly bags.
	I. List and define the various methods used in the transporting and distributing of finished products by taking part in discussion and viewing film on this subject.	I1. Make listing and view film of methods of transportation.
	J. Understand the importance of proper display for finished products to perspective customers by listing methods of attractive displays.	J1. Write a report on methods used in displaying products. Examples: 1. Observe store window displays 2. Observe bulletin boards 3. Observe trophy cases
	K. Understand the flow of goods from the producers to consumers through various channels of distribution.	K1. Develop a flow chart on goods through distribution of various sales outlets. Examples: 1. Retail 2. Wholesale 3. Catalog 4. Discount stores 5. Auctions 6. Door to door

UNIT NO. VII	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
	L. Gain an understanding of the way industries stand back of goods and services for certain lengths of time by listing various types of warrantees and guarantees.	L1. List several types of products and services, warrantees and guarantees offered by industries.

UNIT VIII

8.00 SOCIOLOGICAL AND ENVIRONMENTAL IMPACTS OF INDUSTRY AND TECHNOLOGY — 3 Days

OBJECTIVES: At the end of this unit the student will be able to:

1. Relate the importance of industry to life style.
2. Correlate the importance of job factors and governmental regulations and their effect on the individual, family, and society.

UNIT OUTLINE

8.10 Quality of Life
- 8.11 Job life
- 8.12 Advancements

8.20 Government Regulations
- 8.21 OSHA requirements
- 8.22 Environmental Protection Agency
- 8.23 Compulsory retirement

8.30 Living Conditions
- 8.31 Home life
- 8.32 Crowded conditions
- 8.33 Mass transportation

REFERENCES: THE WORLD OF MANUFACTURING, IACP, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1971. Readings 36, 69, & 78.

Lindbeck, John R., and Irvin L. Lathrop, GENERAL INDUSTRY, Chas. A. Bennett Co., Peoria, Illinois, 1969. Unit 5, and Unit 109--page 567--questionnaire.

Fricker, Ronald H., AN INTRODUCTION TO AMERICAN INDUSTRY, DCA Education Products, Inc., Philadelphia, PA, 1972. Chapter 10.

UNIT NO. VIII	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
8.00	SOCIOLOGICAL AND ENVIRONMENTAL IMPACTS OF INDUSTRY AND TECHNOLOGY THE STUDENT WILL BE ABLE TO:	
8.10	A. Make a comparison of life styles by using mass produced products as an example.	A1. Discuss different kinds of jobs. Examples: 1. Advancement 2. Responsibility 3. Earning power 4. Job relocation possibilities
8.20	A. Take part in class discussion on the various regulations of government.	A1. Discuss the importance of government regulations in regards to: 1. Environmental Protection Agencies 2. OSHA A2. Discuss the necessity of work stoppage: 1. Retirement 2. Disability 3. Unemployment Compensation 4. Pension Plan 5. Social Security 6. Workman's Compensation
8.30	A. Discuss how life styles are affected by industrial area conditions.	A1. Discuss and list how life styles are affected by industrial conditions. Examples: 1. Home life 2. Crowded conditions 3. Mass transportation 4. Pollution

UNIT NO.	SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
		A2. List leisure time activities: Examples: 1. Hobby time 2. Family time 3. Community time 4. Car pools 5. Commuting

8.4

RESOURCES

APPENDIX A

INSIGHTS INTO INDUSTRY AND TECHNOLOGY

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